

What is claimed is:

1. A display device for modifying the colour of light comprising:

5 (a) a first sheet, the first sheet having an outer surface and an inner surface;

(b) a second sheet, the second sheet having an outer surface and an inner surface;

(c) a first liquid;

10 (d) a second liquid, the first and second liquids being immiscible with respect to each other;

(e) a sealed space between the inner surface of the first sheet and the inner surface of the second sheet, the first and second liquids being enclosed therein;

15 (f) a plurality of colored components, the components being located on the outer surface of the second sheet;

(g) a plurality of electrical elements, each element being associated with a colored component;

20 (h) a stylus, the stylus having an electrical switch associated with each of the electrical elements and being in electrical communication with the electrical elements;

such that activation of the switch on the stylus and movement of the stylus in a proximity of the first sheet will cause the first liquid to move to a position such that a  
25 chosen one of the colored components is magnified when viewed through the first sheet.

2. The device of claim 1, further comprising a light reflecting surface located on the outer surface of the second sheet.

5 3. The device of claim 1, further comprising a light source located on the outer surface of the second sheet.

4. A display device for modifying the colour of light comprising:

10 (a) a first sheet, the first sheet having an outer surface and an inner surface;

(b) a second sheet, the second sheet having an outer surface and an inner surface;

15 (c) a first colored liquid, the first liquid having a first colour and an electrical charge;

(d) a second colored liquid, the second liquid having a second colour and being attached to the first liquid;

(e) a third liquid, the first, second and third liquids being immiscible with respect to each other;

20 (f) a sealed space between the inner surface of the first sheet and the inner surface of the second sheet, the first, second and third liquids being enclosed therein;

(g) an electrical element capable of attracting the first liquid when activated;

25 such that activation of the electrical element will cause the first liquid to move to a position proximate to the electrical element such that a chosen one of the colored liquids is visible when viewed through the first sheet.

5. The device of claim 4, further comprising a light reflecting surface located on the outer surface of the second sheet.

5 6. The device of claim 4, further comprising a light source located on the outer surface of the second sheet.

7. The device of claim 4, further comprising at least one additional colored liquid, the additional colored liquid  
10 being attached to at least one other colored liquid.

8. The device of claim 4, further comprising at least one additional electrical element, the additional electrical element being capable of attracting the first colored liquid  
15 when activated, such that activation of the additional electrical element will cause the first liquid to move to a position proximate to the additional electrical element such that a chosen one of the colored liquids is visible when viewed through the first sheet.

20 9. A display device for modifying the colour of light comprising:

(a) a first sheet, the first sheet having an outer surface and an inner surface;

25 (b) a second sheet, the second sheet having an outer surface and an inner surface;

(c) a first colored liquid, the first liquid having a first colour and an electrical charge;

(d) a second colored liquid, the second liquid having a second colour;

(e) a third liquid, the first, second and third liquids being immiscible with respect to each other;

5 (f) a sealed space between the inner surface of the first sheet and the inner surface of the second sheet, the first, second and third liquids being enclosed therein;

(g) an electrical element capable of attracting the first liquid when activated;

10 such that activation of the electrical element will cause the first liquid to move to a position proximate to the electrical element, and the movement of the first liquid will affect a movement on the second liquid such that a chosen one of the colored liquids is visible when viewed through the  
15 first sheet.

10. The device of claim 9, further comprising a reflecting surface located on the outer surface of the second sheet.

20 11. The device of claim 9, further comprising a light source located on the outer surface of the second sheet.

25 12. The device of claim 9, further comprising at least one additional colored liquid.

13. The device of claim 9, further comprising at least one additional electrical element, the additional electrical element being capable of attracting the first colored liquid

when activated, such that activation of the additional electrical element will cause the first liquid to move to a position proximate to the additional electrical element such that a chosen one of the colored liquids is visible when  
5 viewed through the first sheet.

14. A display device for modifying the colour of light comprising:

(a) a first sheet, the first sheet having an outer  
10 surface and an inner surface;

(b) a second sheet, the second sheet having an outer surface and an inner surface;

(c) a first liquid, the first liquid being in the form of a droplet;

15 (d) a second liquid, the first and second liquids being immiscible with respect to each other;

(e) a sealed space between the inner surface of the first sheet and the inner surface of the second sheet, the first and second liquids being enclosed therein;

20 (f) a plurality of colored components, the components being located on the outer surface of the second sheet;

(g) a plurality of electrical elements, the elements being located on the outer surface of the second sheet;

25 (h) a plurality of repellent surfaces, the surfaces being capable of repelling the first liquid and being located on the inner surface of the second sheet;

such that activation of the electrical elements will affect the shape of the droplet such that a chosen one of the

colored components is magnified when viewed through the first sheet.

15. The device of claim 14, further comprising a  
5 reflecting surface located on the outer surface of the second sheet.

16. The device of claim 14, further comprising a light  
source located on the outer surface of the second sheet.

10  
17. An electronic display comprising a stylus, wherein  
electrically insulating droplets are located in an  
electrolyte, and wherein the liquid droplets are moved in  
respect of differently-coloured light filters adjacent to the  
15 droplets by electrowetting and/or electrostatic means, so that  
light passing through appropriately-positioned droplet(s) may  
also pass through the colour filter(s) adjacent to the  
droplet(s), and thereby change the colour of the light, and  
further wherein the function of the stylus is that when it  
20 delivers a suitable electrical potential at its tip which is  
of a certain polarity, and one or more counter electrodes  
located on the opposite side of a hydrophobic polymer layer  
from the droplets simultaneously have an appropriate  
electrical potential of opposite polarity to that delivered by  
25 the stylus applied to it or them, then droplets adjacent to  
the charged counter electrode(s) will be induced to move  
towards the charged counter electrodes; and which system  
further comprises:

a stylus capable of delivering a suitable electrical potential to its tip, and electrically linked to a control system such as a microprocessor IC which is in turn linked to the display system;

5 a switch means associated with the stylus whereby different counter electrodes can be switched on, or modulated, according to which colour the stylus is to 'write' in;

a top layer of insulating and transparent material, which may be hydrophobic polymer;

10 a bottom sheet of hydrophobic polymer layer;

an electrolyte located between the top and bottom layers;

one or more droplets of a liquid insulating material, such as silicone oil located in the electrolyte;

15 any suitable delimiting means preventing the droplets from moving outside their respective designated area;

more than one light filter of more than one different colour;

20 one or more separately-addressable counter-electrodes separated by at least one hydrophobic polymer layer from the droplet(s); and

a light-reflective surface located on the same side of the polymer layer as the counter-electrodes are located.

18. The electronic display of claim 17, further  
25 comprising a power source.

19. The electronic display of claim 17, further comprising an additional electrode of opposite polarity to

that applied to the currently-charged counter electrodes is supplied in a direct connection to the electrolyte.

20. The electronic display of claim 17, further  
5 comprising an additional electrode of opposite polarity to that applied to the currently-charged counter electrodes is supplied into a position immediately adjacent to the electrolyte, but which is electrically insulated from the electrolyte.

10 21. The electronic display of claim 17, wherein the stylus tip is electrically insulated.

15 22. The electronic display of claim 17, wherein an additional counter electrode, preferably extending across the entire area of the screen, and located on the opposite side of the hydrophobic polymer layer from the droplet(s) and electrolyte, is supplied with an appropriate electrical potential of opposite polarity to that delivered by the stylus  
20 tip.

25 23. The electronic display of claim 17, wherein one or more resistant electrodes as used as counter-electrodes, with two or more electrical connections to the resistant electrode permitting different electrical potential to exist at different points across the area of the resistant electrodes, and where correspondingly-positioned areas of different wettability - or any other suitable droplet-impeding or repelling means - are present on the adjacent hydrophobic



polymer layer to the counter-electrodes, so that increased difference of potential between the resistant electrode at different points across its surface on the one hand, and the oppositely-poled potential within or proximate to the electrolyte on the other, can be modulated so as to cause the droplet located adjacent to the polymer layer to consequently move to different locations in relation to the resistant electrode (and thus to move adjacent to differently-coloured light filters, and thereby to cause the droplet to display different colours according to the potential difference.

24. The electronic display of claim 17, wherein a pattern of areas of different wettability is present on the polymer layer.

25. The electronic display of claim 17, wherein the polar droplets are located in an insulating liquid.

26. The electronic display of claim 17, wherein the droplets are immiscible with the insulating liquid, and with each other.

27. The electronic display of claim 17, wherein the stylus is functioning as a ground plane

28. The electronic display of claim 17, wherein the droplets are induced with an electrical potential of a particular polarity

29. The electronic display of claim 17, wherein the upper and/or lower layers of material may be hydrophilic.

5 30. The electronic display of claim 17, wherein the upper and lower layers of material are made from non-polymer materials.

10 31. The electronic display of claim 17, wherein the droplets are charged and the liquid is an insulating liquid.

15 32. The electronic display of claim 17, wherein the droplets are an insulating liquid incorporating charged particles or other liquid sealed within the droplets.

33. The electronic display of claim 17, wherein the droplets are charged and the liquid surrounding them is air.

20 34. The electronic display of claim 17, further comprising a light source or a reflecting means.